



George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

FPD-OI-FD22.2
May 15, 2000

ORGANIZATIONAL INSTRUCTION

Flight Projects Directorate Flight Systems Department Nodes 2/3 Program Group FD22

Quality Management Plan

Revision D

APPROVAL

<u>NAME</u>	<u>TITLE</u>	<u>ORG</u>	<u>DATE</u>
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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2	Revision: D
	Date: May 15, 2000	Page 2 of 2

DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Revision	Rev. A	12/2/97	Corrected Figure 1; corrected Paragraph 3.3.1.1; editorial changes
Revision	Rev. B	2/12/98	Update of flowdown requirements from MSFC Levels 1, 2, 3, and 4 QMS requirements. Editorial changes.
Revision	Rev. C	6/15/99	Corrections for reorganization and consolidation into MSFC Directives System; document number and title change. Previous document was FPO-OWI-JA81.2 dated December 2, 1997.
Revision	Rev. D	5/15/00	Document reformatted to new Flight Projects Directorate standard template.

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 3 of 3

1. GENERAL INFORMATION

1.1 Scope

This Organizational Instruction contains the requirements and provides the approach for Space Station Nodes quality planning within the scope defined by the Marshall Management Manual and the Flight Projects Directorate.

1.2 Purpose

The guidelines and a methodology for accomplishing quality design and production of Space Station Nodes 2 and 3 are presented in this instruction. It includes the rationale and development path dictated in FDP-OI-22.1, "Nodes 2/3 Management Process" and demonstrates how the Flight Project Directorate Nodes Program Group (FD NPG) complies with ISO 9000 requirements.

1.3 Applicability

The instruction applies to the procurement and delivery of the flight hardware and flight support equipment that is the responsibility of FD NPG, or under the auspices of FD NPG in-scope international partners and contractors.

2. APPLICABLE DOCUMENTS

Revision levels of documents are not shown. The latest revision will be used unless otherwise required by contractual requirements or other regulations. In this case the letter revision of the document will be given.

FPD-OI-FD01.1	Management Process
FPD-OI-FD01.2	Authorization and Control of OI's
FPD-OI-FD01.3	Technical Task Agreement Process
FPD-OI-FD22.1	Nodes 2/3 Management Process
MPD 1280.1	MSFC Management Manual
MPG 1050.1	Contract (Customer Agreement) Review
MPG 1280.5	MSFC Preventive Action System
MPG 1410.2	Marshall Management Directives System
MPG 1440.2	Records Management Program
MPG 4000.1	Control of Customer Supplied Product
MPG 6410.1	Handling, Storage, Packaging, Preservation, and Delivery
MPG 7120.1	Program/Project Planning

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 4 of 4

MPG 8060.1	Flight Systems Design Control
MPG 8730.3	Control of Nonconforming Product
MWI 1280.5	MSFC ALERT Processing
MWI 7120.1	Project Quality Plan
NPG 7120.5	NASA Program and Project Management Processes and Requirements

3. ACRONYMS and DEFINITIONS

3.1 Acronyms

ALERT	Acute Launch Emergency Restraint Tip
ASI	Italian Space Agency
CDR	Critical Design Review
CFE	Contractor Furnished Equipment
CSP	Customer-Supplied Product
CSPA	Customer-Supplied Product Arrangement
ESA	Executive Support Assistant
FD01	Flight Projects Directorate
FD NPG	Nodes 2/3 Program Group, MSFC/FD22
FPD/FD	Flight Projects Directorate
GFE	Government Furnished Equipment
IAW	In Accordance With
ISS	International Space Station
ISS NPG	International Space Station Nodes Program Group
ISSPO	International Space Station Program Office
KSAOC	Knowledge, Skills, Abilities, and Other Characteristics
MMM	Marshall Management Manual

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 5 of 5

MSFC	Marshall Space Flight Center
MSA	Management Support Assistant
NWO	New Work Opportunity
OI	Organizational Instruction
PDF	Portable Document Format
PDR	Preliminary Design Review
PRR	Production Readiness Review
S&MA	Safety and Mission Assurance
SRR	Systems Requirements Review
SSNPO	Space Station Nodes Project Office
TIM	Technical Interchange Meeting

3.2 Definitions

Quality Record Quality Records are those documents which are maintained to demonstrate both MSFC conformance to specific requirements and the effective operations of the MSFC system. Such records include those for management reviews, contractor review records, acceptable data packages, database records, audits, and customer complaints.

4.0 INSTRUCTIONS/QUALITY MANAGEMENT SUMMARY

4.1 Quality Management Definition

As part of its quality assurance compliance, the Nodes 2/3 Program Group follows the ISO 9000 methodology as defined at the Marshall Space Flight Center and as it is applicable to the International Space Station Nodes Program Group (FD NPG) at the levels described.

4.2 FD NPG Quality Policy

The FD NPG will provide quality products and services to our customer, the International Space Station Program Office (ISSPO), through a Center-level commitment to excellence, quality, safety, and reliability. Excellence and continuous improvement are goals for each person in the FD NPG for developing and providing safe and reliable Nodes for the ISS assembly. Excellence will be manifested in the FD NPG organization and in its products.

Excellence in engineering and management will be accomplished by the FD NPG through the continuous development of high-quality, professional employees capable of performing the project function with increasing skill. This is done through promotions, training and education, rewards and incentives, individual responsibility, and initiative in an open office.

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 6 of 6

4.3 Quality Management Approach

4.3.1 Understanding and Adherence to MSFC Quality Management System

The MSFC Quality Management System defines requirements that are documented in the MSFC Directive System documentation, as defined in paragraph 4.3.2. Adherence by the Nodes Program Group to these ISO requirements is defined herein. **Those requirements defined by the MSFC Directive System but not addressed in this document are considered not applicable to the Space Station Nodes Project Office (SSNPO), and are negotiable as necessary.** Office level (Level 4) supplementary MSFC Directive System documentation is also available for project control.

The following requirements will be met by the FD NPG per MSFC Directive System and Flight Projects Directorate (FD01) direction as defined in the applicable MSFC Management Manual requirements, system level procedures (MPD's and MPG's), and work instructions.

4.3.1.1 FD NPG Approach to Adherence to ISO 9000 Quality Management System Documents

The FD NPG will adhere to the office instructions defined in Section 4 of FPD-OI-FD22.1 within the following constraints: **If a requirement otherwise listed in the MSFC Directive System element documents does not appear below, it is considered to be out of scope by the FD NPG Project Manager.**

MPD 1280.1; Marshall Management Manual:

- Develop and adhere to quality planning requirements for FD NPG.
- Perform internal quality audits of FD NPG.
- Participate in and support, as required, internal audits of FD NPG conducted by S&MA
- Develop Organizational Instructions for FD NPG which define how specific FD NPG duties are performed within the organization.

ISO 9001 Element No. 1: Management Responsibility

MPG 1280.1 Management Review:

- Adhere to the appropriate MSFC Standard Procedures and Center-Wide Instructions as that are applicable to the FD NPG.
- Maintain quality records, including appropriate reports, files, data sheets, drawings, specifications, tags, letters, and forms which provide objective evidence that the quality requirements have been met. Quality records required are documented and retained according to office procedures.

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 7 of 7

ISO 9001 Element No. 2: Quality System

MPG 7120.1 Program/Project Planning

- Maintain FD NPG Quality Records.
- Develop and maintain an FD NPG Project Plan per MWI 7120.1.
- Prepare an internal Quality Management Plan for FD NPG based on project requirements and the Project Plan. This plan will demonstrate the Quality Management approach and serve as the guidance in conducting FD NPG internal audits.
- Provide objective proof of successful planning and implementation of FD NPG project resources, schedule and performance objectives including quality.

ISO 9001 Element No. 3: Contract Review

MPG 1050.1 Contract (Customer Agreement) Review

- Become aware of New Work Opportunity (NWO) from FD NPG customers.
- Interface with the requesting agent and with the MSFC providing organizations for Nodes 2/3 procurements and customer agreements.
- Determine the treatment of evolved requirements from the FD NPG customer and ensure that the responsibility for implementing any amendment to the Customer Agreement is transferred to the correct supplier functional element.

ISO 9001 Element No. 4: Design Control

MPG 8060.1 Design Control

- Provide an approved Project Plan for design and development of the Space Station Nodes.
- Develop and provide a design process within the scope of MPG 8060.1 to accomplish the mission objectives in response to the project technical requirements and customer (ISSPO) needs.
- Define the design and development activities for FD NPG, which will address the hazard and programmatic risk mitigation.
- Define the design process, including design and development activities, and provide the number and types of design reviews and safety and readiness reviews for FD NPG.
- Define and provide the quality record requirements and retention times for such records and other relevant documentation.
- Define and provide requirements for configuration control and set into place a configuration management structure per MSFC direction.

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 8 of 8

- Within the Project Plan scope, define each design and development activity, including organizational and individual responsibilities, needed facility and test equipment, and detailed schedules.
- Provide customer (ISSPO) project requirements to the design team, including the Chief Engineer.
- Resolve incomplete, ambiguous, or conflicting requirements with the customer, updating Contracts/agreements as appropriate.
- Keep customer (ISSPO) apprised of Space Station Nodes project status.
- Provide validation of the design output against the Nodes project requirements.
- For Design Reviews, define design review committees with appropriate membership, including the customer (ISSPO). Oversee the conduct of the design reviews and document the approved results (a Quality Record).
- Ensure proper design verification at appropriate intervals to establish the acceptable level of confidence to the project, and to ensure the customer that the established requirements will be met. Results will serve as a Quality Record.
- Ensure validation of the Space Station Nodes design by resolving all action items, issues and findings, and proving that the Node design meets the ISS requirements. Results of the design validation will serve as a Quality Record.
- Review and approve any design changes or modifications, with customer agreement, in a timely manner within the configuration control constraints that are in place.

ISO 9001 Element No. 5: Document and Data Control
MPG 1410.2 Marshall Management Directives System

- Identify transition of FD NPG documents to the ISO organizational manager, within the appropriate MSFC and FD NPG controls.
- Establish appropriate ISO Implementation Team membership.
- Document the control and issuance of the FD NPG baselined work instructions, including changes, updates, and cancellations consistent with the appropriate MSFC Quality Assurance instructions.
- As required, provide instructions for generating, revising, canceling, and controlling data consistent with the appropriate MSFC Quality Assurance instructions. Ensure pertinent background information is available for proposed changes and revisions.
- Provide and control any project level forms for the FD NPG, as required.

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 9 of 9

- Review and critique for approval key customer or other key external documents, evaluating for inclusion under the ISO Quality System. Add documents as required, based on approval of FD NPG Manager. Make controlled copies readily accessible.
- Prepare organizational-level deviation/waiver approval requests as appropriate.
- Assure against unintended use of any previous/obsolete versions of applicable FD NPG documents.
- Maintain Master List of FD NPG Level IV work instructions and applicable documents.

ISO 9001 Element No. 7: Control of Customer-Supplied Product

MPG 4000.1 Control of Customer-Supplied Product

- Develop Customer agreements (MPG 1050.1) and customer-supplied products arrangement (CSPA) agreements.
- Ensure verification, storage, maintenance and processing of the Customer-supplied Product (CSP).
- Package and deliver CSP to the customer or other appropriate location.
- If CSP has been lost, damaged, or found unsuitable for use, notify Customer within 24 hours and send written notification with supporting documentation within 10 working days. Retain copy of written notification with supporting documentation for a minimum of 3 years.
- Disposition damage or loss appropriately per MPG 8730.3, MPG 6410.1, and the relevant CSP's.

ISO 9001 Element No. 14: Corrective and Preventive Action

MPG 1280.5 MSFC Preventive Action System

- Assure that acquisition planning and program execution includes the review of appropriate nonconformance data prior to the baselining of the Project Requirements Document or Systems Requirements Document, and hardware and software specifications at SRR, PRR, PDR, and CDR.
- Assure project participation and support to all Preventive Action Requirements in appropriate procedures.
- Disposition all items on the Preventive Actions Issues agenda during major project reviews.
- Conduct Manufacturing/Production Readiness Reviews prior to closure of the Critical Design Review or prior to the initiation of manufacturing.

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 10 of 10

- Take appropriate action to eliminate the possibility of acquiring parts/materials that have the potential for safety nonconformances as defined by the MSFC ALERT system.

ISO 9001 Element No. 16: Control of Quality Records
MPG1440.2 Records Management Program

- Ensure that Organizational Instructions (OI's) identify the applicable and appropriate quality records
- Develop and maintain a retention schedule listing all quality records and records custodian for FD NPG. An electronic identification link will be defined. This information will be maintained in the FD NPG OI's.
- The FD NPG Record Custodian will be responsible for establishing and maintaining documented procedures and instructions for controlling project quality records.
- Submit quality records to the Record Control Organization.

4.3.2 Demonstration of Understanding of ISO 9000 and MSFC Directive System

This section requires that the FD NPG personnel understand ISO 9000 and ISO 9001 as interpreted by the MSFC Quality System. Explanation of the FD NPG quality approach to the Nodes design is defined in detail in FPD-OI-FD22.1.

4.3.2.1 Understanding of Quality Policy

The MSFC Quality policy is as stated in paragraph 4.1.2, with further edification relative to work instructions, quality records, office roles and responsibilities, and personnel qualification, training, and certification given in FPD-OI-FD22.1.

The MSFC Center Standards and Work Instructions are located on the MSFC ISO 9001 home page. By following the steps below, the documents may be accessed in Portable Document Format (PDF) and viewed by using Adobe Acrobat Reader.

For Center-Level Documents

Go to the MSFC Home Page located at <http://www1.msfc.nasa.gov>

Click on "Marshall is ISO 9001 registered!"

Click on Master List. This goes to the list of all Center-level documents, and is arranged numerically. The list can be sorted by ISO Element or by type (MPG, MWI, etc.)

For Flight Projects/Department/Group/Office Level Documents (Specifically FD22 OI's)

Go to the Flight Projects Home Page located at <http://flightprojects.msfc.nasa.gov/>

Click on "ISO 9000"

Click on "FD Master List"

Click on the desired document

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 11 of 11

4.3.2.2 MSFC Management Representative

The duties of the Management Representative include the day-to-day authority and responsibility for the MSFC Quality Management System implementation.

4.3.2.3 Quality Records and the Quality Records Master List

This section addresses the definition and maintenance of the FD NPG Quality Records needed to define, direct, and validate the MSFC Quality System approach. Master lists of the Quality Records for the Center, for the Flight Projects Directorate, and for the FD NPG are to be maintained on a current basis and controlled by an appointed office custodian. These Quality Records must be accessible to all FD NPG personnel on an as-needed basis.

The Space Station Nodes Project Office Quality Records Master List is located in Building 4203, Cubicle 2103 (FD NPG Custodian: Judy Southard (or her replacement); FD22 at TEL: 256/544-1934) and on the FD01 shared folder.

4.3.2.4 Quality Assurance in the Design

Understanding that the Nodes are a late start for the International Space Station (ISS), it is imperative that proper quality assurance and control be integrated into the design process from the beginning. This is accomplished through the normal manned spaceflight process, and under the auspices of the MSFC Quality System. The key Level 4 FD NPG project quality document is:

FPD-OI-FD22.1: Nodes 2/3 Management Process

supplemented by this document:

FPD-OI-FD22.2: Quality Management Plan

These OI's are derived from the Flight Projects Directorate Organizational Instructions:

FPD-OI-FD01.1: Management Process;

FPD-OI-FD01.2: Authorization and Control of OIs

FPD-OI-FD01.3: ISS Technical Task Agreement Process

FPD-OI-FD22.1 defines how the FD NPG will provide quality assurance to the project and will meet the MSFC Standard Procedures and Center-wide Organizational Instructions within the limitations and constraints of the project office. The complementary work instruction, FPD-OI-FD22.2, (this document) serves as the office tool for describing how the office will develop and maintain the FPD-OI-FD22.1 work instruction per the MSFC Quality System direction. The FPD-OI-FD22.2 document is for developing and controlling FPD-OI-FD22.1. Approval and signature authority for the two office-level OWI's are the responsibility of the FD NPG Manager. Backup responsibility and authority is with the Program Management & Integration Team Lead.

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Marshall Space Flight Center Organizational Instruction OPR FD22		
Title-	FPD-OI-FD22.2	Revision: D
Quality Management Plan	Date: May 15, 2000	Page 12 of 12

4.3.3 Quality Management Reviews, Records and Reports

4.3.3.1 Reviews

Quality reviews include both Technical Interchange Meetings (TIMs) with the Program and our International Partners along with their Prime Contractors, and Formal Design Reviews as required by the ISS Program. Quality Assurance discussions are a part of each review agenda.

5.0 NOTES

None

6.0 SAFETY PRECAUTIONS AND WARNING NOTES

None

7.0 APPENDICES, DATA, REPORTS, AND FORMS

None

Marshall Space Flight Center Organizational Instruction OPR FD22		
Title- Quality Management Plan	FPD-OI-FD22.2 Date: May 15, 2000	Revision: D Page 13 of 13

8.0 QUALITY RECORDS

The Space Station Nodes Project Office quality records are maintained in a file in Building 4203, Cubicle 2103, FD NPG Custodian: Judy Southard (or her replacement); FD22, telephone (256) 544-1934.

The Nodes 2/3 Program Group quality records are supplementary to the MSFC Directive System documents defined in FPD-OWI-FD22.1 and are listed in the table below.

Record Title	Description of Record	Authority	Retention	Notes
Design Reviews	Contains approved results of design reviews	This OI, Paragraph 4.3.1.1 Element 4	Length of the on-orbit operational life of the Node elements	Maintained on file in Bldg 4203, Cubicle 2103. Custodian is Judy Southard (or her replacement)
Design Verification	Contains results of design verification	This OI, Paragraph 4.3.1.1 Element 4	Length of the on-orbit operational life of the Node elements	Maintained on file in Bldg 4203, Cubicle 2103. Custodian is Judy Southard (or her replacement)
Design Validation	Contains validation that the Space Station Nodes design meets the ISS requirements	This OI, Paragraph 4.3.1.1 Element 4	Length of the on-orbit operational life of the Node elements	Maintained on file in Bldg 4203, Cubicle 2103. Custodian is Judy Southard (or her replacement)
Customer Supplied Product Notification	Contains written notification with supporting documentation when CSP is lost, damaged, or found unsuitable for use	This OI, Paragraph 4.3.1.1 Element 7	3 Years (Minimum)	Maintained on file in Bldg 4203, Cubicle 2103. Custodian is Judy Southard (or her replacement)

9.0 TOOLS, EQUIPMENT, AND MATERIALS

None

10.0 PERSONNEL QUALIFICATION, TRAINING, AND CERTIFICATION

None

11.0 FLOW DIAGRAM

None

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